U.S. Patent No. 4,611,437 (Cohen) or U.S. Patent No. 5,462,476 (Bohn);

(2) Claims 9-14, 16-20 and 22-34 under 35 U.S.C. §103(a) over Spencer in view of Schultz, further in view of Kovach or Cohen or Bohn, and particularly in view of WO 00/21722 (Biagiotti);

(3) Claim 15 under 35 U.S.C. §103(a) over Spencer in view of Schultz, further in view of Kovach or Cohen or Bohn, and particularly in view of Biagiotti, and especially in view of British Patent No. 665,983 (Maatschappij); and

(4) Claim 21 under 35 U.S.C. §103(a) over Spencer in view of Schultz, further in view of Kovach or Cohen or Bohn, particularly in view of Biagiotti, and especially in view of U.S. Patent No. 3,507,633 (Dewez).

With regard to the rejections under 35 U.S.C. §103, Claims 1 and 24 are the only pending independent claims. Claim 1 is rejected as being obvious over a combination of Spencer in view of Schultz and further in view of Kovach or Cohen or Bohn. Each of the rejections is also based on the same combination as well as either one or two additional references. Claim 24 is rejected over the

same references as applied to claim 1 and one additional reference, Biagiotti. None of the applied references teach the claimed invention as evident from the rejections being under 35 U.S.C. §103 rather than §102. Applicants respectfully submit that one skilled in the art would not have selected for combination the applied references since there is no teaching or suggestion in the applied art which would motivate a combination in a manner to obtain applicants' invention as claimed. No recognition of the technical problem addressed by applicants is set forth. Further, no other common technical problem is addressed between the applied art. The devices described in the references are different structurally and in operation from the device and method claimed by applicants. Applicants respectfully submit that the rejections are based on an ex post facto reasoning and misconstrue the teachings of the references and the invention as claimed.

More specifically, the technical problem underlying applicants' claimed device and method is the provision of a more efficient sharpening unit for a disk-shaped cutting tool having a hardened smooth (i.e., not serrated) cutting edge and, preferably, also having a

substantially constant thickness, i.e., not being conical in shape as in conventional prior art devices.

Spencer, is based on the underlying idea of providing a sharpening unit with two different sharpening wheels, which have different functions and features and which are non-symmetrically arranged with respect to the central plane of a disk-shaped cutting blade.

Applicants' invention as claimed is based on providing a first grinding wheel 81 having a finer grain than a second grinding wheel and arranged parallel to a respective side of a cutting bevel (see Figure 7 of the captioned application). The first grinding wheel, as defined in claim 1, provides support for the cutting blade. The first grinding wheel as claimed is structured and arranged to act on the hardened side of the blade (the hardening coating on this side of the bevel is marked T in Figure 7) and does not wear or damage the hardening coating. The first grinding wheel, therefore, does not gradually remove material from the cutting blade and the hardened cutting edge is therefore maintained.

To the contrary, if the grinding wheel 81 were more aggressive, i.e., had a coarser grain, the wheel would be as a common sharpening wheel as in Spencer and would

simply act on the blade by removing the entire hardened layer T, thus damaging the blade. Accordingly, the fine grain of the claimed first grinding wheel does not remove cutting blade material in order to sharpen it the blade, but rather provides support for the blade such that the blade does not flexurally deform (under the pressure of the second grinding wheel).

Additionally, the fine grain first grinding wheel 81 is structured to remove possible burrs on the tip of the cutting edge of the blade 19, the burrs being generated by the second grinding wheel 83. The abrading action of the fine grain first wheel 81 is further reduced (besides using a fine grain) by the first grinding wheel being at an inclination (α) to the bevel which is greater than the inclination of the blade flank (angle β).

A further basis of distinction over the applied art is that the second grinding wheel 83 has a coarser grain structure, than that of the first grinding wheel, i.e., is more aggressive and removes the metal from which the cutting blade 19 is made. The second grinding wheel 83 is structured to act on a part of the cutting blade which is different from the part on which the first grinding wheel 81

acts. This feature is a significant distinction as is more apparent below.

The second more aggressive grinding wheel 83 is the wheel which sharpens the cutting blade 19. To provide this action, the second wheel is positioned "flat" against a respective side of the cutting blade (see Figure 7), i.e., the active surface of the grinding wheel 83 is substantially parallel to the corresponding side of the cutting bevel. The second grinding wheel serves to remove the outer layer of metal forming the blade and, therefore, sharpen the blade 19 to maintain the cutting bevel sharp.

The pressure exerted by the second grinding wheel 83 tends to flexurally deform the blade 19. Further, the aggressive action of the second grinding wheel 83 will cause burrs or chips to form on the tip of the cutting bevel of the blade 19. Both the flexural deformation and burrs/chips are counter-acted by the structure and corresponding action of the first grinding wheel 81. As set forth above, the first grinding wheel 81 as claimed has a finer grain which eliminates burrs from the cutting bevel and acts on the blade 19 from the side opposite the second grinding wheel 83. The first grinding wheel 81 further, as set forth above, exerts a supporting reaction force on the blade which

balances the force exerted by the second grinding wheel 81 such that the blade 19 does not flexurally deform.

Accordingly, the structure and arrangement of the claimed sharpening unit provides significant advantages, for example as noted below.

– A thin cutting blade can be used since the flexural deformations are reduced to a minimum based on the first and second wheel positioning and action on both sides of the blade.

– Actual sharpening occurs only on one side of the cutting blade. Sharpening units are known where a single sharpening wheel is provided acting on one and the same side of the blade. Such devices, however, have the disadvantage that the blade must be very thick to resist flexural deformations. A thick blade is heavy and costly to produce, as well as opening in operation a space in the material being cut a distance corresponding to the thickness of the blade. This generates dramatic compression forces in the material being cut and a large resistance momentum, which breaks the blade and requires high power to keep the blade into rotation.

– Allows extended use of cutting blades having a peripheral hardening coating since sharpening occurs

substantially only on one side (sharpening implying removal of material by abrasion), the peripheral portion of the blade containing a hardening coating remains formed by the hardened layer (T) of the material from which the blade is made.

Thus, the claimed sharpening unit solves the problems of prior art devices and provides a sharpening unit suitable for sharpening a thin, hardened cutting blade.

None of the references applied against claims 1 and 24 address or solve the same problems addressed and solved by the claimed device and method. There is no recognition in the applied art of the technical problems addressed by applicants, as well as no teaching or suggestion of a solution of the problem as claimed by applicants.

The Examiner asserts that Schultz discloses a sharpening unit for sharpening a disk-shaped cutting blade. This is incorrect since the veneer knife 10 of Schultz is rectilinear, not disk-shaped. Thus, one reasonably skilled in the art would not combine the teaching of Spencer, which concerns a rotating disk-shaped blade for log saws, with Schultz, which concerns a rectilinear veneer knife. There is no reason for one skilled in the art to combine Schultz

to the teaching of Spencer in view of the structural differences of the articles being acted on and the tool providing the action. Spencer discloses a heavy log saw machine with rotating disk blades, whereas Schultz concerns a portable sharpening tool for a rectilinear veneer knife. Thus, the two references relate to entirely different pieces of machinery, including from the point of view of their dimension, application and manner of use. There is no basis for one skilled in the art to combine Spencer and Schultz together to obtain applicants' claimed device and method.

Further, applicants submit that even if one skilled in the art would have combined Spencer and Schultz, such would still not result in the claimed device and method. The claims also require that the first and second grinding wheels have different grains relative to each other in order to provide different functions on two separate and different sides of the cutting bevel. There is no suggestion of providing in different grinding wheels positioned in relation to a cutting blade different grains or abrading features for the two wheels of Spencer or Schultz. Indeed, Spencer requires an entirely symmetrical sharpening blade arrangement. Schultz requires an asymmetrical sharpening blade arrangement, yet both

sharpening blades are used to abrade the opposite surfaces of the veneer knife.

Thus, in order to reject the claims, the Examiner relies on alternative tertiary references, i.e., Kovach, Cohen or Bohn.

Kovach describes a method and apparatus for simultaneously grinding a workpiece with first and second grinding wheels. More specifically, Kovach teaches use of a rough grinding wheel and a finish grinding wheel in sequence to grind one and the same surface of the workpiece. Thus, Kovach does not teach or suggest to one skilled in the art to use two different grinding wheels having different grain sizes to act on two separate and different portions of a common workpiece, i.e., the cutting blade.

Accordingly, even upon consideration of Kovach, applicants' claimed device and method would not be achieved. Moreover, there is no reason whatever for one skilled in the art to look to Kovach to find any teaching or suggestion to modify the sharpening unit of Spencer or Schultz to obtain the invention as claimed.

More specifically, Spencer and Schultz teach using two sharpening wheels to act on two separate and opposite sides of the same cutting blade. Kovach teaches use of two

grinding wheels to sequentially rough-grind and fine-grind one and the same surface of a workpiece. If Spencer, Schultz and Kovach were combined, in view of the specific teachings thereof, such would result in use of four sharpening wheels in the Spencer log saw, namely, a first rough sharpening wheel and a second fine sharpening wheel on one side of the blade; and a third rough sharpening wheel and a fourth fine sharpening wheel on the opposite side of the blade. This, however, is not what is claimed by applicants.

One skilled in the art would not combine Kovach with Spencer and Schultz to arrange a fine-grain sharpening wheel on one side and a rough or coarse-grain sharpening wheel on the other side of the rotating disk-shaped blade of Spencer since this is not taught or suggested by Kovach. Moreover, the problem solved by Kovach is to more quickly perform a complete grinding cycle on a workpiece. In order to achieve this, different grinding wheels are used in sequence on the same surface which is contrary to applicants' claimed device or method. Further, this problem has no relationship or connection with the device of Spencer or with the device of Schultz or with the problem underlying applicants' invention.

Cohen also does not provide the invention as claimed upon combination with Spencer and Schultz. Cohen refers to generic sharpening systems and tools, which are clearly not suitable for use in a log saw as disclosed in Spencer. Cohen clearly refers to sharpening tools for manually sharpening hand-operated knifes or the like.

Moreover, Cohen teaches providing one tool with different sharpening bars. Each bar is used alternatively on different knives or sequentially on the same knife. However, there is no suggestion in Cohen to use two sharpening bars having different "sharpening powers" to act on one and the same disk-shaped cutting blade, and to act on opposite flanks or sides of the same cutting bevel. Cohen relates to the different technical field of manually operated sharpening tools for sharpening knives or the like. There is no reason why one skilled in the art of log saws (Spencer) would look to this technical field and modify Cohen to obtain applicants' claimed device. The structure disclosed in Cohen is inconsistent with a log saw sharpening unit as taught by Spencer.

The remarks as to Cohen also apply to Bohn. Bohn describes a manually movable sharpening stone for sharpening a hand blade laid on a support table. In view of the

difference in structure and purpose, it would not be obvious to modify Spencer or Schultz in view of Bohn in a manner to obtain applicants' invention as claimed in the absence of applicants' own teaching.

Further with respect to claim 24, the Examiner relies on Biagiotti in combination with Spencer, Schultz and Kovach or Cohen or Bohn. Biagiotti does not make up for the shortcomings of the other references. Biagiotti teaches a hardened blade on which a single sharpening wheel acts to sharpen one side of the blade. Biagiotti cannot be combined with Spencer because Biagiotti relates to a single grinding wheel arrangement, whereas Spencer teaches two opposite symmetrically arranged sharpening wheels.

Biagiotti clearly teaches that if a hardened blade is to be used, then a single sharpening wheel must be used. See Figure 5 of Biagiotti wherein it is clearly shown that if the side F1 of the blade is hardened, in order to have a hardened cutting edge, such blade cannot be used in a device as taught by Spencer since the two sharpening wheels of Spencer would simply destroy the outer hardened layer (having a very tiny thickness) and thus would make the entire (very expensive) hardening process useless. For this reason, Biagiotti teaches to sharpen a hardened blade by a

single sharpening wheel 20, which acts only on that side of the cutting blade which has not been hardened.

Therefore, one skilled in the art who desires to improve the log saw of Spencer would have incorporated the Biagiotti teaching into the Spencer teaching by removing the blade and the sharpening unit of Spencer and by replacing them with the blade and the single-wheel sharpening unit of Biagiotti. This is different from what is claimed by applicants.

As to the dependent claims, the rejections rely on the same references of Spencer, Schultz, Kovach, Cohen, Bohn and Biagiotti and further in view of an additional reference, Maatschappij or Dewez. Each of Maatschappij and Dewez are relied on to provide an additional limitation in a dependent claim and, thus, do not make up for the shortcomings of the primary and secondary references as set forth above.

Accordingly, the references as applied against claims 1 and 24, and claims dependent thereon, lack a sound basis for combination, in particular in a manner so as to obtain applicants' device and method as claimed. Thus, applicants respectfully submit that the claims are not rendered obvious within the meaning of 35 U.S.C. §103.

Withdrawal of the rejections under 35 U.S.C. §103 is respectfully requested.

Reconsideration and allowance of the application are respectfully urged.

Respectfully submitted,

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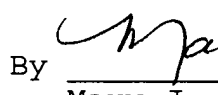
By 

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